AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claim 1 (currently amended): A method of monitoring signals, comprising:

receiving signals from a plurality of sensors over a period of time;

decomposing the signals into separate signal components within one or more frequency bands;

selecting a frequency band within the one or more frequency bands;

determining spatial and temporal characteristics of the signal components within the selected frequency band, wherein the spatial and temporal characteristics include a combination of complex sources; and

isolating a subset of the signal components within the selected frequency band, based on the spatial and temporal characteristics of the signal components, to determine isolated signal components.

Claim 2 (original): The method of Claim 1, wherein the signals include biological signals and the signal components include biological signal components.

Claim 3 (original): The method of Claim 2, further comprising determining a location of a signal source corresponding to the isolated signal components.

Claim 4 (original): The method of Claim 2, wherein the isolated subset of the signal components includes biological signal components and isolating the subset of the biological signal components includes maximizing differences between the subset of the biological signal components and other biological signal components within the selected frequency band.

Claim 5 (original): The method of Claim 2, wherein determining spatial and temporal characteristics of the biological signal components includes identifying a first biological signal component of the biological signal components, calculating a strength of the first biological signal component at a first time, and thereafter measuring the strength of said first biological signal component at a later time.

Claim 6 (original): The method of Claim 2, wherein decomposing the biological signals includes determining a phase and a magnitude characteristic for the biological signal components.

Claim 7 (original): The method of Claim 2, wherein the biological signals include at least one of electroencephalographic (EEG) signals, electrocardiographic (ECG) signals and electromyographic (EMG) signals.

Claim 8 (original): The method of Claim 2, wherein the biological signals include EEG signals, and the frequency band is selected from the group consisting of: delta, theta, alpha, sigma, beta, and gamma bands.

Claim 9 (original): The method of Claim 2, wherein the biological signals include functional magnetic resonance imaging (fMRI) signals.

Claim 10 (currently amended): The method of Claim 1, wherein

the selected frequency band is a first selected frequency band,

the one or more frequency bands ~~include a plurality of frequency bands~~ further include a second selected frequency band, and the method further comprises:

determining spatial and temporal characteristics of the signal components within the send selected frequency band, wherein the spatial and temporal characteristics include a second combination of complex sources;

isolating a subset of the signal components within the second selected frequency band, based on the spatial and temporal characteristics of the signal components, to determine isolated signal components; and

matching at least some of the isolated signal components in the first selected frequency band with at least some of the isolated signal components in second selected frequency band.

Claim 11 (currently amended): The method of Claim 1, wherein determining spatial and temporal characteristics of the ~~biological~~ signal components includes identifying a convolutive mixing model for the signal components.

Claim 12 (original): A system for monitoring biological signals, comprising:

a plurality of sensors for receiving biological signals;

a first memory configured to decompose the received plurality of signals into separate signal components within one or more frequency bands and select a first frequency band;

a second memory configured to determine spatial and temporal characteristics of the biological signal components in the first frequency band, wherein the spatial and temporal characteristics include a combination of complex sources; and

a third memory configured to isolate a subset of the biological signal components within the first frequency band, based on the spatial and temporal characteristics of the biological signal components, to obtain isolated biological signal components.

Claim 13 (original): The system of Claim 12, further comprising a display for displaying the isolated biological signal components.

Claim 14 (original): The system of Claim 12, further comprising a storage for storing the biological signals.

Claim 15 (original): The system of Claim 12, wherein the third memory is configured to isolate a subset of the biological signal components by maximizing the difference between subsets of biological signal components within the first frequency band.

Claim 16 (original): The system of Claim 12, further comprising a fourth memory configured to determine a location of a signal source corresponding to the isolated biological signal components.

Claim 17 (original): The system of Claim 12, wherein the second memory is configured to determine the spatial and temporal characteristics of the biological signal components by:

identifying a first biological signal component in the biological signal components, calculating the strength of the first biological signal component at a first time, and thereafter measuring the strength of said first biological signal component at a later time.

Claim 18 (original): The system of Claim 12, wherein the second memory is configured to determine the spatial and temporal characteristics of the biological signal components by identifying a convolutive mixing model for the biological signal components.

Claim 19 (original): The system of Claim 12, wherein the first memory is configured to decompose the biological signals by determining a phase characteristic and a magnitude characteristic for the biological signal components.

Claim 20 (original): The system of Claim 12, wherein at least two of the first memory, the second memory and the third memory are included in a common memory.

Claim 21 (new): The method of claim 1, wherein at least one of the complex sources includes a complex-valued random variable having a circularly symmetric probability distribution.

Claim 22 (new): The method of claim 1, wherein the spatial and temporal characteristics of the signal components within the selected frequency band include a separating matrix that relates the signal components within the selected frequency band to the complex sources.

Claim 23 (new): The method of claim 22, wherein determining the spatial and temporal characteristics of the signal components within the selected frequency band includes determining the separating matrix by optimizing a likelihood function that relates the separating matrix, the complex sources, and the signal components within the selected frequency band.

Claim 24 (new): The method of claim 22, wherein determining the spatial and temporal characteristics of the signal components within the selected frequency band includes constraining the mixing matrix to be real-valued.

Claim 25 (new): The method of claim 1, wherein the spatial and temporal characteristics of the signal components within the selected frequency band include a mixing matrix that relates the complex sources to the signal components within the selected frequency band.

Claim 26 (new): The system of claim 12, wherein at least one of the complex sources includes a complex-valued random variable having a circularly symmetric probability distribution.

Claim 27 (new): The system of claim 12, wherein the spatial and temporal characteristics of the signal components within the selected frequency band include a separating matrix that relates the signal components within the selected frequency band to the complex sources.

Claim 28 (new): The system of claim 27, wherein determining the spatial and temporal characteristics of the signal components within the selected frequency band includes determining the separating matrix by optimizing a likelihood function that relates the separating matrix, the complex sources, and the signal components within the selected frequency band.

Claim 29 (new): The system of claim 27, wherein determining the spatial and temporal characteristics of the signal components within the selected frequency band includes constraining the mixing matrix to be real-valued.

Claim 30 (new): The system of claim 12, wherein the spatial and temporal characteristics of the signal components within the selected frequency band include a mixing matrix that relates the complex sources to the signal components within the selected frequency band.

Claim 31 (new): The system of claim 12, wherein

the first memory is further configured to select a second frequency band;

the second memory is further configured to determine spatial and temporal characteristics of the biological signal components in the second frequency band, wherein the spatial and temporal characteristics include a second combination of complex sources; and

the third memory is further configured

to isolate a subset of the biological signal components within the second frequency band, based on the spatial and temporal characteristics of the biological signal components, to obtain isolated biological signal components, and

to match at least some of the isolated signal components in the first selected frequency band with at least some of the isolated signal components in second selected frequency band.

Claim 32 (new): A computer-readable medium that stores a computer program for monitoring signals, wherein the computer program includes instructions for:

receiving signals from a plurality of sensors over a period of time;

decomposing the signals into separate signal components within one or more frequency bands;

selecting a frequency band within the one or more frequency bands;

determining spatial and temporal characteristics of the signal components within the selected frequency band, wherein the spatial and temporal characteristics include a combination of complex sources; and

isolating a subset of the signal components within the selected frequency band, based on the spatial and temporal characteristics of the signal components, to determine isolated signal components.